

We claim:

1. A continuous process for preparing alkylamines by reacting C₁₋₄-alkanols with ammonia in the gas phase in the presence of a shape-selective fixed-bed catalyst in a cooled reactor, wherein the shape-selective fixed-bed catalyst is present in a single contiguous fixed bed in the reactor and tubes through which coolants are passed run within the fixed bed to regulate the temperature of the fixed bed.
2. A process as claimed in claim 1, wherein cooling is carried out by means of boiling water cooling.
3. A process as claimed in claim 1 or 2, wherein the pressure in the coolant is from 40 to 220 bar and the pressure in the fixed catalyst bed is from 10 to 50 bar.
4. A reactor for the reaction of C₁₋₄-alkanols with ammonia in the gas phase for preparing alkylamines, which comprises a shape-selective fixed-bed catalyst which is present as a single contiguous fixed bed in the reactor and through whose interior tubes through which a coolant can be passed run.
5. A continuous process for preparing alkylamines by reacting C₁₋₄-alkanols with ammonia in the gas phase in the presence of a shape-selective fixed-bed catalyst in a reactor, wherein part of the C₁₋₄-alkanols, the ammonia or mixtures thereof introduced into the reactor is fed into the fixed catalyst bed at at least one point at which a previously reacted reaction mixture of C₁₋₄-alkanols and ammonia which has a temperature higher than that of the C₁₋₄-alkanols, ammonia or mixtures thereof fed in is present.
6. A continuous process for preparing alkylamines by reacting C₁₋₄-alkanols with ammonia in the gas phase in the presence of a shape-selective fixed-bed catalyst in a reactor, wherein part of the C₁₋₄-alkanols, the ammonia or mixtures thereof is introduced in liquid form into the reactor in such a way that vaporization takes place on the fixed catalyst bed.
7. A continuous process for preparing alkylamines by reacting C₁₋₄-alkanols with ammonia in the gas phase in the presence of a shape-selective fixed-bed catalyst in a reactor, wherein a heat transfer medium which is inert toward the C₁₋₄-alkanols and ammonia and the reaction products and/or does not significantly

affect the activity and selectivity of the catalyst is additionally fed into the fixed catalyst bed.

- 5 8. A process as claimed in claim 7, wherein the heat transfer medium is or comprises water.
9. A process as claimed in any of claims 5 to 7 carried out in a reactor as claimed in claim 4.
- 10 10. A process as claimed in claim 9, wherein the C₁₋₄-alkanols, ammonia or mixtures thereof introduced into the reactor are fed in radially to the longitudinal axis of the reactor.